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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

D. Remarks

Issue 1 - Whether claims 1-4 and 6-20 are patentable under 35 U.S.C. §102(e) over U.S. Patent No. 6,303,459 (Chen).

5 The rejection of claims 1-4 and 6-11 will first be addressed.

The invention of claim 1 recites a method of verifying a reticle that includes forming a conformal layer over a non-resist deposited layer that is formed on a uniform surface. The deposited layer includes a reticle pattern. The method further includes inspecting the reticle pattern for defects.

10 As is well established, anticipation requires the presence of a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.<sup>1</sup>

The cited reference *Chen* does not show a non-resist deposited layer that includes a reticle pattern. The rejection relies on the following to show a deposited layer that includes a reticle pattern:

15

[F]orming a conformal layer over a non-resist deposited layer (Chen figure 1 # 16 over non-resist layer 14)...<sup>2</sup>

20 Thus, the final rejection argues that layer 14 of *Chen* shows the "deposited layer that includes a reticle pattern" recited in claim 1. As noted previously, however, all figures in *Chen* show that layer 14 remains unpatterned. Accordingly, Applicants strongly believe that an unpatterned layer cannot show a layer with a reticle pattern, as recited in claims 1 and 12.

The final rejection appears to rebut Applicants' previous showing by relying on teachings from Applicants' Specification.

25

More specifically page 10 lines 1-3 recite, "...A Step 204 may initially form a reticle pattern within a layer of resist. Such a pattern may then be transferred (sic.) underlying layers: and clearly seen from figures 2A to 2D.

<sup>1</sup> See Lindemann Maschinenefabrick GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984).

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It is not understood how this citation supports the rejection. The above citation of Applicants' Specification describes but one particular example of forming a reticle pattern in a layer of resist. Such a reticle pattern is then transferred to an underlying non-resist layer, thus forming a non-resist layer with a reticle pattern. As shown in Applicants' FIG. 2E, a conformal layer (210-10 and/or 210-11) is formed over the non-resist patterned layer (202-10). Thus, the above excerpts of the Specification provide but one possible implementation of the invention of claim 1.

This is in very sharp contrast to the reference *Chen*. Applicants again emphasize, layer 16 of *Chen* (argued to correspond to Applicants' conformal layer) is formed over layer 14 of *Chen* (argued to correspond to Applicants' non-resist deposited layer including a reticle pattern). However, layer 14 is not patterned. Thus, layer 16 of *Chen* cannot be formed over a deposited layer including a reticle pattern, as set forth in claim 1.

In addition or alternatively, the cited reference *Chen* does not show an inspecting of the reticle pattern for defects, as recited in claim 1. Applicants have previously provided the following to show that the teaching of *Chen* are directed to reticle alignment, and not inspection of the reticle for defects:

With this reference point, the position of the reticle is adjusted over the wafer such that the reticle is precisely aligned with the previous layer on the wafer. A laser beam is typically used by the wafer stepper to sense the position of the alignment mark on the wafer.<sup>3</sup>

To rebut Applicants' showing, the final rejection argues that a reasonable interpretation of Applicants' claim would result in reticle alignment being included in the step of inspecting a reticle for defects:

Applicants' have not specified the type of defect in the claims and in specification page 12 lines 11 to 14 state: "It is further noted that by increasing contrast in a

<sup>2</sup> See the Final Office Action, dated 7/16/03, Page 2, last full paragraph of the page.

<sup>3</sup> *Chen*, Col. 2, Lines 60-63.

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pattern under inspection, the present invention may also allow an inspection system to use wafer auto-alignment features during the initial inspection setup.” (emphasis supplied).<sup>4</sup>

5 Applicants do not understand how this excerpt supports the rejection. The excerpt clearly indicates that auto-alignment occurs in an initial inspection setup. Applicants contend the plain an ordinary meaning of “an inspection setup” would be understood to be preparatory steps prior to a task of inspection, and not the task of inspection itself. In support, Applicants’ provide the following dictionary definition:

## Setup

b : the preparation and adjustment of machines for an assigned task...<sup>5</sup>

10 Applicants’ believe the above presents clear evidence that an initial inspection setup is not an inspection itself.

15 Accordingly, because the cited reference *Chen* does not show the formation of a conformation layer over a non-resist deposited layer including a reticle pattern, this ground for rejection is traversed.

20 In addition or alternatively, because the cited reference does not show the inspecting of a reticle pattern for defects, this ground for rejection is traversed.

The rejection of claims 12-16 will now be addressed.

25 The invention of claim 12 is directed to a method of verifying a reticle that includes the steps of forming a conductive conformal layer greater than 100 Å over a deposited layer patterned with a reticle. The method also includes inspecting the pattern in the deposited layer.

To address this ground for rejection, Applicants’ incorporate by reference herein the comments set forth above for claim 12. Namely, the reference *Chen* never shows the formation of conductive conformal layer over deposited layer patterned with a reticle. Further, the reference does not the step of inspecting the pattern in the deposited layer.

<sup>4</sup> See the Final Office Action, dated 7/16/03, Page 7, Lines 16-20.

<sup>5</sup> Merriam-Webster On-Line Dictionary, 2003.

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The rejection of claims 17-20 will now be addressed.

Claim 17 is directed to a method that includes forming at least one reticle patterned layer on a uniform surface, and increasing an inspection contrast between patterned and non-patterned portions of the reticle patterned layer by forming a conformal layer over the reticle patterned layer. The method further includes inspecting the reticle patterned layer.

To address this ground for rejection, Applicants' incorporate by reference herein the comments set forth above for claim 17. Namely, the reference *Chen* never shows the formation of a conformal layer over deposited layer patterned with a reticle. Further, the reference does not the step of inspecting the pattern in the deposited layer.

Issue 2 - Whether Claim 4 is patentable under 35 U.S.C. §102(e) over *Chen*.

Claim 4 is separately patentable over *Chen*, as it includes additional limitations not shown in the cited reference.

Claim 4 recites that the conformal layer comprises a layer of titanium nitride formed over a layer of titanium. This limitation is not shown in *Chen*. The reference indicates that various materials may be used in a diffusion layer (argued to correspond to Applicants' conformal layer). However, this list does not show the arrangement recited in claim 4:

A typical diffusion barrier layer 16 may contain silicon nitride, phosphosilicate glass (PSG), silicon oxynitride, aluminum, aluminum oxide (Al<sub>x</sub>O<sub>y</sub>), tantalum, titanium nitride, niobium, or molybdenum. A barrier layer is typically deposited using rf. sputtering, to a thickness between about 500 to 1000 Angstrom.<sup>6</sup>

It is noted that this is the only reference to titanium in the entire reference. It is clear from the above excerpt that *Chen* only teaches titanium nitride, and does not mention titanium. Accordingly, the reference does not show a layer of titanium nitride formed over a layer of titanium, as recited in claim 4.

The final rejection rebuts Applicants' previous showing with the following argument:

<sup>6</sup> *Chen*, Col. 5, Line 66 to Col. 6, Line 2.

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With respect to claim 4 *Chen* in col. 6 lines 1-2 describes a *titanium* and titanium nitride layers. Multi layers of several materials like TaN formed over Ta/Al (col. 6 line 1, col. 6, line 6) and alternative materials include TiN over Al/Ti (col. 6 lines 1-3, etc.).<sup>7</sup>

5

Applicants reiterate that there is no reference to a titanium nitride/titanium arrangement like that of claim 4 in the cited reference. That is, the rejection's assertions that *titanium* or aluminum formed on titanium (Al/Ti), is shown, are incorrect – only titanium nitride is shown. Applicants' believe the above excerpt from *Chen* (which includes all portions relied upon in  
10 rejecting claim 4) is conclusive evidence that the limitations of claim 4 are not shown in the cited reference.

Accordingly, because all the limitations of claim 4 are not shown in the reference, this ground for rejection is traversed.

15 Issue 3 - Whether Claim 8 is patentable under 35 U.S.C. §102(e) over *Chen*.

Claim 8 is separately patentable over *Chen*, as it includes additional limitations not shown in the cited reference.

Claim 8 recites that a deposited layer comprises a layer of undoped silicon dioxide formed on a layer of phosphosilicate glass (PSG). This limitation is not shown or suggested by  
20 *Chen*. PSG is never shown or suggested to be a material for layer 14 of *Chen* (argued to correspond to Applicants' deposited layer).

The final rejection rebuts Applicants' previous showing with the following argument:

With respect to claim 8 *Chen* in col. 5 lines 59-60 states its layer (14 – passivation  
25 layer) can contain undoped silicon oxide/silicon nitride... and substrate 10 (over which layer 14 is formed) can be made from several materials including PSG especially in SOI substrates.<sup>8</sup>

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<sup>7</sup> See the Final Office Action, dated 7/16/03, Page 8, Lines 5-8 (emphasis).

<sup>8</sup> See the Final Office Action, dated 7/16/03, Page 8, Lines 9-12.

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Applicants note that the assertion "and substrate 10 (over which layer 14 is formed) can be made from several materials including PSG especially in SOI substrates" is not from the cited reference *Chen*. Thus, the Examiner has relied on a teaching outside of the reference to show all of Applicants' claim limitations. Accordingly, a rejection based on anticipation for this claim is improper, and should be withdrawn.

If the rejection is based on 35 U.S.C. §103(a), and the Examiner is taking official notice regarding PSG and SOI substrates, Applicants seasonably traverse such an argument and request a reference in support.

Accordingly, because the rejection relies on teachings outside the cited reference, the rejection based on anticipation is improper, and this ground of rejection is traversed.

Issue 4 - Whether Claim 13 is patentable under 35 U.S.C. §102(e) over *Chen*.

Claim 13 is separately patentable over *Chen*, as it includes additional limitations not show in the cited reference.

Claim 13 recites that inspecting the pattern comprises automatically inspecting the pattern with pattern inspection equipment. The limitations of claim 13 are not shown in *Chen*.

As noted in the comments above for claim 1, it is not believed that the alignment step of *Chen* can be considered a pattern inspection step (i.e., the plain language of meaning of "setup" indicates a preparatory step). Further, there is no mention of an automatic inspection with pattern inspection equipment.

Issue 5 - Whether Claim 16 is patentable under 35 U.S.C. §102(e) over *Chen*.

Claim 16 is separately patentable over *Chen*, as it includes additional limitations not show in the cited reference.

Claim 16 recites very particular steps for patterning a deposited layer with a reticle. As noted in the comments for claim, just as the reference shows no patterning of a deposited layer, the reference cannot show the particular steps recited in claim 16.

The rejection of this claim relies on the following arguments.

With respect to claim 16, wherein the patterning of the deposited layer with the reticle includes: patterning a layer of resist formed over the deposited layer with

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the reticle pattern (Chen col. 3 lines 20-25), etching the deposited layer (Chen figure 3 col. 6 lines 27 to 46)...<sup>9</sup>

As noted above, the rejection argues that layer 14 corresponds to Applicants' "deposited layer". However, if reference is made to FIG. 3 of *Chen* (relied upon by the rejection) layer 14 is not patterned. Thus, the reference cannot show the particular limitations of claim 16.

Issue 5 - Whether Claim 5 is patentable under 35 U.S.C. §103(a), over *Chen* in view of U.S. Patent No. 5,985,693 (*Leedy*).

Claim 5, which depends from claim 2 recites that a reticle pattern in the deposited layer includes features having a minimum size L, and the conformal layer has a thickness of no more than 1/2L.

As is well understood, to establish a prima facie case of obviousness, a rejection must meet three basic criteria. First, there must be some suggestion or motivation to modify a reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference(s) must teach or suggest all claim limitations.

To the extent that this ground for rejection relies on the reference *Chen*, the comments set forth above for claim 1 are incorporated by reference herein. Namely, that various limitations of the base claim are not shown or suggested. Thus, all claim limitations are not suggested by the cited combination, and a prima facie case of obviousness has not been established.

In addition or alternatively, it is also well established that a prima facie case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention.<sup>10</sup> The reference *Leedy* clearly teaches away from the invention of claim 5.

Claim 5 recites particular limitations to a reticle pattern formed in a deposited layer. It will be recalled that such a deposited layer is a non-resist layer. The teachings of *Leedy* are directed to patterning resist layers.<sup>11</sup> That is, Applicants' claim 5 explicitly recites a non-resist layer, yet the reasoning relied upon by the rejection is aimed at the opposite: a resist layer. Thus, the reference *Leedy* clearly teaching away from Applicants' non-resist claims. Accordingly, even

<sup>9</sup> See the Final Office Action, dated 7/16/03, Page 8, Lines 9-12.

<sup>10</sup> *In re Geisler*, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997).

1110  
See  
previous  
rejection  
pages 8-9



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if a prima facie case of obviousness has been established (Applicants' contend that this is not the case) the above citation is clear evidence rebutting any such case.

To address Applicants' showing the rejection relies on the following reasoning:

5 Applicants' argument... is not persuasive for several reasons (similar to that stated under 1 above) namely Applicants' claim when given broadest interpretation in light of the specification clearly shows its pattern being in the resist layer (Figs. 2A to D, pages 9 last line and page 10 lines 1-13, etc.). Therefore Leedy does not teach away from presently recited claim 5.

10

Applicants' respectfully disagree. Again, Applicants' claim clearly recites a patterned non-resist layer. Interpreting the term "non-resist" to include "resist" is not reasonable.

Accordingly, a prima facie case of obviousness has not been established for this claim, and this ground for rejection is traversed.

15

*not excluded  
from claims*

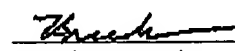
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<sup>11</sup> See *Leedy*, Col. 35, Line 63-65.

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The present claims 1-20 are believed to be in allowable form. It is respectfully requested that the application be forwarded for allowance and issue.

Respectfully Submitted,

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